Prevention of Significant Air Quality Deterioration Review

Preliminary Determination

November 14, 2018

Facility Name: Albany Lumber
City: Albany
County: Dougherty
AIRS Number: 04-13-095-00117
Application Number: 26682
Date Application Received: August 24, 2018

Review Conducted by:
State of Georgia - Department of Natural Resources
Environmental Protection Division - Air Protection Branch
Stationary Source Permitting Program

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SUMMARY

The Environmental Protection Division (EPD) has reviewed the PSD permit application submitted by Albany Lumber for a permit to construct and operate a lumber mill consisting of a sawmill, three direct-fired continuous lumber drying kilns with natural gas burners, a planer mill, a diesel-fired emergency fire pump engine and storage tanks for diesel and gasoline. The proposed project will allow Albany Lumber to produce up to 360 million board feet of dried lumber per year. The mill will be located at 3194 Sylvester Road, Albany (Dougherty County).

Dougherty County is classified as "attainment" or "unclassifiable" for SO_2, $PM_{2.5}$ and PM_{10}, NO_X, CO, and ozone (VOC).

The construction and operation of the Albany Lumber will result in an emissions increase of 771 tons per year of VOC, 12.2 tpy of PM, 43.3 tpy of CO, 32.2 tpy of NOx, 54 tpy of methanol and 71 tpy of Hazardous Air Pollutants. The proposed lumber mill will be a Title V major source of VOC and Hazardous Air Pollutants (HAPs). A Prevention of Significant Deterioration (PSD) analysis was performed for the facility for all pollutants to determine if any increase was above the PSD "significance" level. The VOC emissions increase was above the PSD threshold of 250 tons per year. Albany Lumber will be PSD major source for VOC emissions.

It is the preliminary determination of the EPD that the proposed Albany lumber provides for the application of Best Available Control Technology (BACT) for the control of VOC from all sources at the lumber mill as required by federal PSD regulation 40 CFR 52.21(j).

Approved modeling techniques have determined that the estimated VOC emissions will not cause or contribute to a violation of any ambient air standard in the area surrounding the facility or in the two Class I areas located within 200 km of the facility. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

EPD review of the data submitted by Albany Lumber related to the proposed lumber mill construction indicates that the project will be in compliance with all applicable state and federal air quality regulations.

This Preliminary Determination concludes that an Air Quality PSD Permit should be issued to Albany Lumber for the construction and operation of a new lumber mill at 3194 Sylvester Road in Albany (Daugherty County). Various conditions have been incorporated into the proposed construction and operating permit to ensure and confirm compliance with all applicable air quality regulations.

1.0 INTRODUCTION – FACILITY INFORMATION AND EMISSIONS DATA

On August 24, 2018, Albany lumber submitted an expedited PSD permit application for an air quality permit to construct and operate a new lumber mill at 3194 Sylvester Road in Albany (Dougherty County). Table 1-1 summarizes the Title V major source status of the proposed lumber mill.

Table 1-1: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	yes			✓
PM_{10}	yes			✓
$PM_{2.5}$	yes			✓
SO_2	yes			✓
VOC	yes	✓		
NO_x	yes			✓
CO	yes			✓
Individual HAP	yes	✓		
Total HAPs	yes	✓		
Total GHGs	yes			✓

Based on the proposed project description and data provided in the PSD permit application, the estimated incremental increases of regulated pollutants from the facility are listed in Table 1-2 below:

The emissions calculations for Tables 1-2 can be found in detail in the facility's PSD permit application (see Appendix B of the PSD permit Application No. 26682). These calculations have been reviewed and approved by the Division.

Table 1-2: Emissions Increases from the Project

	Potential Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
PM	12.1	25	No
PM_{10}	12.8	15	No
$PM_{2.5}$	9.69	10	No
VOC	771	40	Yes
NO_X	32.2	40	No
CO	43.4	100	No
SO_2	0.4	40	No
TRS	0	10	No
Pb	0	0.6	No
Fluorides	0	3	No
H_2S	0	10	No
SAM	0	7	No

The definition of baseline actual emissions is the average emission rate, in tons per year, at which the emission unit actually emitted the pollutant during any consecutive 24-month period selected by the facility within the 10-year period immediately preceding the date a complete PSD permit application was received by EPD. The proposed facility will be a new lumber mill. Hence past emissions are zero Albany Lumber.

Based on the information presented in Table 1-2 above, Albany Lumber's proposed construction and operation, as specified per Georgia Air Quality Application No. 26682, is classified as a major source under PSD because the potential emissions of VOC exceed the PSD threshold of 250 tons per year.

Through its new source review procedure, EPD has evaluated Albany Lumber's proposal for compliance with State and Federal air quality requirements. The findings of EPD have been assembled in this Preliminary Determination.

Emission Unit Listing

		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
CDK1	Drying Kiln No. 1 Direct-fired / Continuous Fuel Type = Natural Gas Capacity = 120 MMbf/yr NG Burner 40 MMBTU/hr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 40 CFR 52.21(j) 391-3-1-.02(2)(b)1. 391-3-1-.02(2)(e)1. 391-3-1-.02(2)(g)2. 391-3-1-.02(2)(n)	2.1, 2.4, 2.5,2.6, 2.13, 2.14, 2.15, 3.1, 3.2, 4.2, 5.2, 7.1, 7.2,7.5, 7.6, 7.7, 7.8, 7.9, 7.14, 7.15	N/A	None
CDK2	Drying Kiln No. 2 Direct-fired / Continuous Fuel Type = Natural Gas Capacity = 120 MMbf/yr NG Burner 40 MMBTU/hr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 40 CFR 52.21(j) 391-3-1-.02(2)(b)1. 391-3-1-.02(2)(e)1. 391-3-1-.02(2)(g)2. 391-3-1-.02(2)(n)	2.1, 2.4, 2.5,2.6, 2.13, 2.14, 2.15, 3.1, 3.2, 4.2, 5.2, 7.1, 7.2,7.5, 7.6, 7.7, 7.8, 7.9, 7.14, 7.15	N/A	None
CDK3	Drying Kiln No. 3 Direct-fired / Continuous Fuel Type = Natural Gas Capacity = 120 MMbf/yr NG Burner 40 MMBTU/hr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 40 CFR 52.21(j) 391-3-1-.02(2)(b)1. 391-3-1-.02(2)(e)1. 391-3-1-.02(2)(g)2. 391-3-1-.02(2)(n)	2.1, 2.4, 2.5,2.6, 2.13, 2.14, 2.15, 3.1, 3.2, 4.2, 5.2, 7.1, 7.2,7.5, 7.6, 7.7, 7.8, 7.9, 7.14, 7.15		
PM	Planer Mill 360 MMBF/yr	391-3-1-.02(2)(b)1. 391-3-1-.02(2)(e)1. 391-3-1-.02(2)(n)	2.1, 2.4, 2.5, 2..13, 2.14, 3.1, 3.2, 4.1, 7.1, 7.4, 7.14, 7.15	PMC	Planer Mill Shavings Cyclofilter
FE	Emergency Fire Pump Engine	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b)1.	2.2, 2.4, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 5.3, 7.1, 7.3, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15	N/A	None
T1	Large Diesel Storage Tank 10,000 gallon	391-3-1-.02(2)(b)1.	2.3**,** 2.4, 2.5, 7.1, 7.14, 7.15	N/A	None
T2	Gasoline Storage Tank 1000 gallon	391-3-1-.02(2)(b)1.	2.3**,** 2.4, 2.5, 7.1, 7.14, 7.15	N/A	None

2.0 PROCESS DESCRIPTION

According to Application No. 26682, Albany Lumber has proposed to construct and operate a new lumber mill at 3194 Sylvester Road in Albany (Dougherty County). Albany Lumber will be capable of producing up to 360 MMbf kiln dried lumber per year.

Albany Lumber will consist of a sawmill, three direct-fired continuous drying kilns with a 40 MMBTU/hour natural gas-fired burner for each kiln, a Planer mill that can process up to 360 MMbf/year. Additionally, the facility will have a 250 hp diesel emergency firewater pump and several storage tanks for storing gasoline and diesel fuel. The storage tanks are classified as insignificant sources/activities based on emissions.

Sawmill and Green End Operations

Incoming logs will be stored on-site prior to processing. Logs are debarked (LD) and then cut to length within the log bucking process (LB) before being routed through the sawmill (SM). The end product of this process is rough, green dimensional lumber, some of which will be sold without further processing. By-products from this operation include bark, chips and sawdust which will be conveyed and stored in various locations at the mill prior to being shipped off site.

Bark conveyance (BC) will include bark from the debarker to the bark hog and then to a bark storage bin before being shipped offsite. Chip conveyance (CC) will include chips from the sawmill to the sawmill chipper/screen, from the chipper to chip screen, from the chip screen to the chip bin or chip pile (CP), from the chip bin and chip pile to the truck. Sawdust conveyance (SDC) will include sawdust from the sawmill and log bucking to the sawdust storage bin and from the bin to the truck. Shavings conveyance (SC) will move shavings from the planer mill cyclone to loadout in trucks.

Direct-Fired Continuous Drying Kilns (CDK1, CDK2 and CDK3)

The rough, green lumber will be sorted and stacked before being dried in one of the three continuous lumber drying kilns. Each of the three kilns (CDK1, CDK2 and CDK3) will have a maximum drying capacity 120 MMbf/yr. Each drying kiln will each have a 40 MMBtu/hr natural gas-fired burner. After drying, the rough lumber will be dried in the planer mill.

Planer Mill (PM)

Planer shavings and planer hog trim will be conveyed to the shavings storage bin. A cyclofilter (PM) will be used to pneumatically convey planer mill shavings.

The Albany Lumber PSD permit application and supporting documentation can be found online at https://epd.georgia.gov/air/psd112gnaa-nsrpcp-permits-database

3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS

State Rules

Visible Emissions – Rule (b)

This regulation limits visible emissions to 40 percent opacity from facility sources unless regulated elsewhere. This generally applicable requirement applies to all point sources at the Albany Lumber mill. Albany Lumber sources will comply with this rule as required in the PSD Permit once issued.

Sulfur Dioxide Emissions – Rule (g)

Georgia Rule (g)2 limits fuel sulfur content for the fuel-burning sources constructed or extensively modified after January 1, 1972 to 2.5% sulfur by weight. The fire pump diesel engine (FE) and three natural gas burners in the continuous drying kilns (CDK1, CDK2, CDK3) are subject to this regulation. The emergency fire pump will be fired with ultra-low sulfur diesel fuel with less than 15 ppm of sulfur and will easily comply with Rule (g)2 sulfur content limit (2.5%). The continuous drying kiln burners will be fired with natural gas that has negligible sulfur content and will easily comply with the Rule (g)2 sulfur content limit.

Particulate Matter (PM) Emissions – Rule (e)

Georgia Rule (e) regulates PM emissions from manufacturing processes. All units not subject to the fuel-burning equipment PM emissions at the facility are subject to this generally applicable requirement as follows:

$E = 4.1P^{0.67}$ (P <= 30 ton/hr)
$E = 55P^{0.11} - 40$ (P > 30 ton/hr)

Where P is the process input weight rate in tons/hr and E is the allowable emission rate in lb/hr.

The proposed new debarker (LD), log bucking (LB), sawmill (SM), three continuous drying kilns (CDK1, CDK2, CDK3), planer mill with cyclofilter (PM), chip pile (CP), chip, bark, sawdust and shavings conveyance (CC, BC, SDC, SC) will be subject to this regulation. Allowable PM emissions under this regulation for these equipment are listed in Table below.

Table: PM Emission Rates from Manufacturing Processes

Process	Emission Unit ID	Production (P) (ton/hr)	Rule (e) allowable PM (lb/hr)	Potential PM (lb/hr)
Debarker	LD	328.0	64.02	0.09
Log Bucking	LB	328.0	64.02	1.47
Sawmill	SM	298.4	62.94	0.28
Continuous Drying Kiln No. 1	CDK-1	48.3	44.26	0.33
Continuous Drying Kiln No. 2	CDK-2	48.3	44.26	0.33
Continuous Drying Kiln No. 3	CKD-3	48.3	44.26	0.33
Planer Mill Cyclofilter	PM	14.0	24.03	1.03
Chip Pile	CP	90.8	50.31	3.52E-06
Chip Conveyance	CC	90.8	50.31	0.48
Bark Conveyance	BC	29.6	39.68	0.05
Sawdust Conveyance	SDC	28.2	38.37	0.02
Shavings Conveyance	SC	14.0	24.03	0.01

The above table clearly shows that all sources at the Albany Lumber will comply with the Rule (e) PM emission limit.

Fugitive Dust Emissions Georgia Rule (n)

This rule applies to all sources and activities at the Albany Lumber that generates fugitive dust such as unpaved roads used by trucks hauling logs, lumber, chips, barks and sawdust etc. Under this rule opacity of fugitive emissions is limited to 20%.

Federal Rule - PSD

PSD regulations in 40 CFR 52.21 require that any new major source or modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to PSD regulations under the Clean Air Act. The PSD review requirements apply to any new or modified source which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant or to all other sources having potential emissions of 250 tons per year or more of any regulated pollutant. They also apply to any modification of a major stationary source which results in a significant net emission increase of any regulated pollutant. Lumber mills do not belong to one of the 28 specific source categories under the PSD rules.

Georgia has adopted a regulatory program for PSD permits, which the United States Environmental Protection Agency (EPA) has approved as part of Georgia's State Implementation Plan (SIP). This regulatory program is located in the Georgia Rules at 391-3-1-.02(7). This means that Georgia EPD issues PSD permits for new major sources pursuant to the requirements of Georgia's regulations. It also means that Georgia EPD considers, but is not legally bound to accept, EPA comments or guidance.

A commonly used source of EPA guidance on PSD permitting is EPA's Draft October 1990 New Source Review Workshop Manual for Prevention of Significant Deterioration and Nonattainment Area Permitting (NSR Workshop Manual). The NSR Workshop Manual is a comprehensive guidance document on the entire PSD permitting process.

The PSD regulations require that any major stationary source or major modification subject to the regulations meet the following requirements:

- Application of Best Available Control Technology (BACT) for each regulated pollutant subject to the PSD rules;
- Analysis of the ambient air impact;
- Analysis of the impact on soils, vegetation and visibility;
- Analysis of the impact on Class I areas and
- Public notification of the proposed plant in a newspaper of general circulation

The Albany Lumber PSD permit application indicates that the above PSD requirements will be complied with.

Following are the applicable federal rules and regulations for sources at the proposed Albany Lumber mill. This discussion will be followed by a discussion of the top-down BACT analysis for Albany Lumber.

New Source Performance Standards (NSPS)

The diesel-fired emergency fire pump engine (FE), must comply with all applicable provisions of 40 CFR 60 Subpart IIII (engine NSPS) per 40 CFR 60.4200(a)(2)(ii).

The fire pump engine (FE) at Albany Lumber will be a new, diesel-fired engine subject to NSPS Subpart IIII for Stationary Compression Ignition Internal Combustion Engines. Emission standards for fire pump engines are listed in Table 4 of the subpart IIII as per 40 CFR 60.4205(c).

The fire pump engine is required to meet these standards for the life of the engine and will be certified to these standards in accordance with 40 CFR 60.4211(c). All diesel fuel used in the fire pump engine will have a maximum sulfur content of 15 parts per million (PPM) per 40 CFR 60.4207(b). A non-resettable hour meter will be installed on the fire pump engine prior to startup per 40 CFR 60.4209(a) to record non-emergency hours of operation. The fire pump engine will be operated and maintained according to the manufacturer's emission-related written instructions per 40 CFR 60.4211(a)(1).

The fire pump engine will operate less than 100 hours per calendar year for maintenance checks and readiness testing and less than 50 hours per year in non-emergency situations where the allowable 50 hours per year of non-emergency operation are counted as part of the 100 hours per year in accordance with 40 CFR 60.4211(f).

National Emissions Standards For Hazardous Air Pollutants (NESHAPS)

40 CFR Part 63 Subpart DDDD – National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products

The Albany Lumber facility's continuous lumber drying kilns (CDK1, CDK2 and CDK3) are subject to all applicable provisions of the Plywood and Composite Wood Products (PCWP) Maximum Achievable Control Technology (MACT) standard, 40 CFR 63 Subpart DDDD. This rule applies to any PCWP manufacturing facility located at a major source of HAP emissions. Lumber kilns are affected sources under the PCWP MACT pursuant to 40 CFR 63.2232(b); therefore, the proposed new continuous lumber drying kilns are subject to this rule. However, no control requirements are specified by the rule for lumber kilns, only initial notification requirements. Per 40 CFR 63.9(b)(1)(iii), Albany Lumber's PSD permit application serves as that initial notification for the proposed new continuous drying kilns. Per 40 CFR 63.9(b)(4)(v), this regulation also requires a notification of the actual date of startup of the source, delivered or postmarked within 15 calendar days after that date. The startup notification will be submitted for the continuous kilns (CDK1, CDK2, CDK3) following construction.

40 CFR Part 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion (RICE) Engines

The facility will install and operate a post-2006 year model emergency fire pump diesel engine that is considered a "new emergency stationary RICE" under 40 CFR 63.6590(a)(2)(ii) since it is rated less than 500 hp, is located at a major source of HAP emissions and constructed after June 12, 2006.

The engine is subject to 40 CFR 63 Subpart ZZZZ but will comply through NSPS IIII as outlined in 40 CFR 63.6590(c)(6).

Title V Operating Permit – 40 CFR 70

Albany Lumber is subject to the major source operating permit requirements under Title V of the Clean Air Act since VOC and HAPs emissions exceed Title V major source thresholds for these pollutants. Albany Lumber must submit a Title V permit application using the Georgia EPD Online System (GEOS) within 12 months after issuance of the construction and operation PSD permit.

State and Federal – Startup and Shutdown and Excess Emissions

Excess emission provisions for startup, shutdown and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. Excess emissions from the Albany Lumber associated with the proposed project would most likely result from a malfunction of the associated control equipment. The facility cannot anticipate or predict such malfunctions. However, the facility is required to minimize emissions during periods of startup, shutdown and malfunction.

Federal Rule – 40 CFR 64 – Compliance Assurance Monitoring (CAM)

Under the general applicability criteria, CAM applies to units that use a control device to achieve compliance with an emission limit and whose pre-controlled emissions levels exceed the major source thresholds under the Title V permitting program. Although other units may potentially be subject to CAM upon renewal of the Title V operating permit, such units are not being modified under the proposed project and need not be considered for CAM applicability at this time. CAM applicability will be evaluated when the facility submits a Title V permit application for the Albany Lumber within a year after the issuance of the first PSD SIP permit to the Albany Lumber.

Albany Lumber will have a Planer Mill Cyclofilter (PMC) that will operate as inherent process equipment as the primary purpose of the cyclofilter is material recovery and not PM control. Therefore a CAM plan will not be required for the planar mill cyclofilter. The drying kilns and sawmill do not have any pollution control equipment. The proposed lumber mill is a major source for VOC and HAPs only. The facility is a Title V minor source of PM emissions. Since the drying kiln burners are fired with clean burning natural gas, combustion PM emissions from the drying kiln are insignificant.

Therefore, this applicability evaluation only addresses the drying kilns which are major source of VOC and HAPs emissions, which does not employ any air pollution control devices for VOC or HAPs; therefore, the CAM requirements are not triggered by the proposed construction and operation of the Albany Lumber mill.

4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant enough to trigger PSD review for Volatile Organic Compounds (VOC).

Continuous Drying Kilns- Background

The continuous lumber drying kilns (CDK1, CDK2 and CDK3) are direct-fired kilns with a 40 MMBTU/hr natural gas-fired burners for each kiln. The drying kilns will dry the green lumber from the sawmill to the desired moisture content. The drying process results in emissions of VOC and HAPs emissions. Natural gas-firing in the kiln burners results in NOx and CO emissions. The drying kilns don't have any add-on VOC controls.

Definition of BACT

Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction/control that EPD, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such a facility through application of production processes and available methods, systems and techniques. BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if EPD determines that there is no economically reasonable or technologically feasible way to measure the emissions and hence to impose an enforceable emissions standard, EPD may require the source to use a design, equipment, work practice or operations standard or combination thereof to reduce emissions of the pollutant to the maximum extent practicable.

Georgia EPD requires PSD permit applicants to use the 5 Step top-down process in the BACT analysis. The five steps of a top-down BACT review procedure consist of:

Step 1: Identification of all applicable control technologies;
Step 2: Elimination of technically infeasible technologies;
Step 3: Ranking of remaining (feasible) control technologies by control effectiveness;
Step 4: Evaluation of the most cost effective controls and documentation of results and
Step 5: BACT selection.

Albany Lumber's PSD permit application followed the five step top-down BACT review process.

Continuous Drying Kilns – VOC Emissions

Applicant's Proposal

Albany Lumber followed U.S. EPA's recommended five-step "top-down" process to complete the BACT assessment for the proposed new continuous kilns.

Albany Lumber investigated potentially applicable emission control technologies by reviewing U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC database), technical literature, control equipment vendor information and by using process knowledge and engineering experience from similar types of units in operation at other Georgia-Pacific (GP)-owned facilities.

Albany Lumber searched the RBLC database to identify the emission control technologies and emission rates determined by permitting authorities as BACT for the wood products industry, wood lumber kilns (Process Code 30.800 in the RBLC). Albany Lumber found that no "add-on" control technologies have been implemented as part of a PSD or LAER permitting effort to control VOC emissions from lumber drying kilns regardless of drying method (batch or continuous kilns).

This RBLC finding was included in Table C-10 in Appendix C of the PSD permit application. None of the lumber drying kilns at any of GP's manufacturing facilities utilize "add-on" pollution controls to remove VOC emissions. In addition no lumber kilns operating in the U.S. utilize "add-on" pollution controls to remove VOCs since the technology for VOC control of kiln emissions is technically unfeasible and not cost effective.

While "add-on" controls have not been demonstrated for lumber drying kilns, the following control technologies have been demonstrated to reduce VOC emissions from other industrial processes.

Step 1 – Identification of Control Technologies

Albany lumber considered the following VOC emission control technologies in their VOC BACT evaluation for the Continuous drying kilns.

- Thermal Oxidation
- Catalytic Oxidation
- Condensation
- Carbon Adsorption
- Wet Scrubbing
- Biofiltration
- Proper Kiln Design and Operation

EPD Review – VOC Control for direct-fired continuous kilns

EPD reviewed the above potential control technologies for VOC control for continuous drying kilns and the Division agrees with the control technology identification in the PSD permit application.

Step 2 – Elimination of Technically Infeasible Control Options:

Basic technical challenges identified with controlling VOC emissions from lumber kilns with the use of several potential control technologies are categorized as follows:

- Exhaust gas collection and
- Collection and treatment of condensate.

Albany Lumber proposes to heat the process air exiting the kiln exhaust stacks to a temperature above the point of condensation (above 200 ^{0}F) to prevent condensation and formation of stickies inside the exhaust ducts. Based on previous experience with condensation within GP plywood, oriented strand board (OSB) and particleboard VOC capture and control systems, Albany Lumber concludes the process air captured from the kiln exhaust stacks would need to be heated to a minimum of 200°F in order to capture and treat VOCs in the exhaust gas stream and without any condensation taking place.

Control Technology Option 1 (Thermal Oxidation): Due to the moisture content and "stickies" in the exhaust stream, the kiln exhaust presents some technical challenges. The exhaust stream requires pre-heating prior to entering the regenerative thermal oxidizer (RTO) and a robust fire detection and suppression system, which adds additional capital and operational cost. RTOs for controlling VOC from Kiln exhaust is technically feasible.

Control Technology Option 2 (Catalytic Oxidation)**:** The exit stream conditions from the lumber drying kilns are not optimal for catalytic oxidation. Fouling or poisoning from other contaminants in the waste gas stream makes this technology technically unfeasible. Catalysts must periodically be replaced due to thermal aging, adding significantly to the cost of operating the unit in addition to creating solid waste. Catalytic oxidation has never been applied to a lumber drying kiln.

Catalytic oxidation using a regenerative catalytic oxidizer (RCO) is not a viable VOC control technology for kiln exhaust gas stream due to the particulate matter (PM), metals and acidic content of the exhaust gases. Poisoning occurs when heavy metals in the gas stream become chemically bound to the catalyst and reduce the surface area for oxidation of VOC emissions. Based on this analysis, Catalytic Oxidizer control technology is considered technically infeasible. Even if it is technically feasible control costs would be the same or higher than for thermal oxidation despite the low fuel costs due to lower operating temperature.

Control Technology Option 3 (Condensation)**:** Condensation is not feasible because of the low temperature required of the exhaust stream with the potential of freezing the water vapor in the gas stream. Condensation requires that the exhaust stream be cooled to a temperature low enough that the vapor pressure of the exhaust gases is lower than the VOC concentration of the exhaust gases.

The primary constituent of the VOC in the exhaust gas stream from the lumber kilns is terpenes which require the exhaust stream temperature to be lowered to well below 32 °F in order to have a vapor pressure low enough to use condensation. A temperature of 32 °F would cause the water vapor in the exhaust stream to freeze, and the resulting ice particles would clog the condensation unit.

As such, condensation is not technically feasible to control VOC emissions from a lumber kiln and is not further considered in this BACT analysis.

Control Technology Option 4 (Carbon Adsorption)**:** Carbon Adsorption is not feasible because of the high humidity of the exhaust gas stream. The presence of water in exhaust gases will decrease the ability of VOCs to be absorbed. As previously mentioned, exhaust gases from lumber drying kilns have a relative humidity of 100%; therefore, the humidity of the exhaust gas will compete with VOC adsorption and greatly reduce the VOC control efficiency of the unit.

Terpenes, the primary VOC constituent in kiln exhaust gases, must be thermally desorbed. As a result, the temperatures necessary for desorption are excessively high and would likely damage any commercially-available adsorption media. The adsorption capacity of an activated carbon system is higher with lower exhaust gas temperatures since desorption takes place near the boiling point of the VOC within the exhaust gas.

As previously mentioned, Albany Lumber proposes to heat the exhaust gas above 200 °F to prevent any condensation of the exhaust gas stream in the ductwork. This temperature is above the boiling point for some of the VOC components within the exhaust gas (e.g. formaldehyde and methanol). Therefore, VOC control is expected to be greatly reduced at this high exhaust temperature. It is also likely that the "stickies" contained in the kiln exhaust gas stream would plug the activated carbon bed with a build-up of condensable PM. Based on all of these reasons, Carbon adsorption control technology is considered technically infeasible.

Control Technology Option 5 (Wet Scrubbing)**:** Wet Scrubbing is not feasible because this requires water soluble VOC compounds to be controlled and the constituents of the drying kiln exhaust gas stream are not water soluble. The adsorption media could easily be plugged. The primary VOC constituents of kiln exhaust gases, pinenes and terpenes are not water soluble. Therefore, these constituents would not be easily adsorbed in a wet scrubber, and the VOC removal efficiency would be quite low, on the order of 10-20%. In addition, the viscous nature of the "stickies" within the exhaust gas will easily plug the scrubber absorption media. Therefore, wet scrubbing control technology is not technically feasible.

Control Technology Option 6 (Biofiltration)**:** Biofiltration is not feasible due to the inconsistent flow of the exhaust stream and also the potential for buildup of insoluble VOC compounds within the biofilter bed which could plug the media. No vendor has designed a biofiltration system to remove VOC emissions from a lumber drying kiln exhaust gas stream.

As previously discussed, to prevent condensation and the buildup of "stickies" inside of the exhaust ductwork between the kiln and control equipment, Albany Lumber believes it would be necessary to heat the kiln exhaust gases to temperatures above that which condensation would occur or above 200 ^{o}F.

Exhaust gas stream temperatures well above 105 °F would kill the bacteria contained in the filter media of the biofilter and thereby render the biofilter system ineffective.

The primary constituents in the exhaust gas are pinenes and terpenes, which are insoluble in water. The biofilter will be ineffective at breaking down pinenes and terpenes. Additionally, due to the highly viscous nature ("sticky") of these compounds, VOCs are expected to build-up within the biofilter bed, plugging the media and reducing its control/removal effectiveness. The use of biofiltration to remove VOCs from a lumber kiln exhaust gas stream is therefore technically infeasible.

The Division has reviewed Step 2 (evaluation of VOC control technologies) of applicant's BACT selection process and agrees with Albany Lumber that the use of catalytic oxidation, condensation, carbon adsorption, wet scrubbing and biofiltration are technically infeasible.

Option 7 Proper Kiln Design and Operation

This is the most viable/feasible control option for controlling VOC emissions from continuous drying kilns. This option consists of monitoring the moisture content of the dried lumber as it comes out of the planer mill to ensure product consistency and minimization of VOC emissions.

BACT selection process Step 3 – Ranking of Remaining Control Technologies:

The following is a ranking of the control technologies based on control effectiveness found in Section 5.1 of the PSD permit application. There are only two technically feasible options which are shown below.

Table 4-1: Ranking of VOC Control Technology for continuous drying kilns

Control Technology Ranking	Control Technology	Control Efficiency
Option 1	RTO	97%
Option 7	Proper Kiln Design and Operation	Variable due to design

The Division agrees with Albany Lumber that the RTO is ranked as the most effective control technology to use with the continuous kilns for VOC control from a control efficiency perspective.

Step 4 of BACT selection process – Evaluation of Most Stringent Controls:

A cost effectiveness evaluation was prepared for the RTO on the proposed new continuous kiln with the natural gas firing, as it is the only add-on control technology that is potentially technically feasible.

Based on engineering estimates, the cost estimate analysis assumes Albany Lumber would install two RTOs (one RTO to control CDK1 and the other RTO to control CDK2 and CDK3). The cost of controlling VOC emissions with an RTO is estimated at approximately $10,762 per ton of VOC as carbon (C) removed from CDK1 and $9,759 per ton of VOC as (C) from CDK2 and CDK3. The cost of the RTO exceeds the benefit of the VOC reduction. In addition, RTO results in generation of NOx and CO emissions. NOx is a ozone precursor.

Albany Lumber provided a detailed cost analysis in Tables C3 to C9 of the PSD permit application. This cost effectiveness value is largely due to the cost of heating the lumber kiln exhaust air to a temperature of approximately 200°F to prevent condensation and the formation of "stickies" in the exhaust ductwork while the exhaust gases leave the kiln, leading into the control system. Based on the high cost effectiveness value for removing VOCs from the continuous lumber kilns using an RTO, Albany Lumber does not believe it is economically feasible to use this (RTO) control technology for controlling VOC emissions from the drying kilns.

The Division agrees with Albany Lumber that the RTO costs exceed the benefit of the VOC reduction from the continuous kilns in addition to increasing NOx and CO emissions due to operation of the RTO. In addition, there are energy and environmental impacts associated with the use and combustion of natural gas in the RTO. The combustion of natural gas as an RTO fuel would create additional NO_X, CO and CO_2 emissions. The generation of these emissions simply to reduce VOC emissions may result in a net negative environmental effect.

The US Southeast is NO_X limited with respect to ozone formation. Therefore small increases in NO_X (i.e., generated from natural gas combustion in an RTO) could result in increased ozone, while relatively larger increases in VOC will likely not result in ozone increases.

The control technologies require energy to operate fans to move the exhaust gases through a significant amount of ductwork, requiring significant electricity for a RTO control system. The indirect heated ducting and the RTO also require the use of supplemental fuel to heat the ductwork and maintain the appropriate combustion temperature within the RTO.

The only economically cost effective control technology for removing VOC emissions from the proposed new continuous kilns is the use of "proper design and operating practices".

Since this control option is the top remaining BACT control technology after showing that other "add-on" control systems are not technically or economically viable, a cost effectiveness evaluation is not required for this BACT selection.

BACT selection Step 5 – BACT Selection for the Continuous Drying Kilns:

Results of the top-down BACT analysis indicate that there are no demonstrated control techniques in common practice, numerous technical challenges and no cost-effective add-on control technologies for removing VOC emissions from lumber drying kilns exhaust and consequently the BACT proposed for the proposed new continuous kilns is "no add-on control" with the use of "proper design and operating practices" as BACT.

Albany Lumber identified VOC BACT for the continuous drying kilns as Proper Maintenance and Work Practices. Section 5.1.5 of the PSD permit application to describe the BACT selection for continuous lumber drying kilns for VOC control.

The proposed BACT work practices for the proposed new continuous kiln consist of (1) proper kiln maintenance and (2) minimizing over-drying while meeting the relevant lumber moisture specifications.

BACT is generally an emission limit. However in the case of continuous kilns which are an emerging technology, enough test data does not exist to impose a VOC BACT limit on the facility. Therefore, BACT in this case is not a numerical value, but proper maintenance and work practices for the continuous lumber drying kilns. Work practices will include proper maintenance of the kiln and minimizing over-drying and recordkeeping of good combustion practices.

EPD Review – VOC Control

The Division reviewed all of the RBLC entries for VOC from continuous lumber drying kilns since 2002. This review showed that none of the entries require an add-on control device for VOC and that BACT is Proper Maintenance and Operating Practices.

Conclusion – VOC Control

The BACT selection for the dual path direct-fired continuous lumber drying kiln is proper maintenance and work practices and is incorporated in Condition 4.2 of the PSD permit for Albany Lumber. This condition contains general work practice standards for the continuous wood drying kilns and scheduled maintenance activities.

Table 4-2: BACT Summary for the Continuous Drying Kilns (CDK1, CDK2 and CDK3)

Pollutant	Control Technology	Proposed BACT Limit	Compliance Determination Method
VOC	Proper kiln design and operation.	Work Practice and Preventive Maintenance program	Continuous monitoring of moisture of the dried lumber as it comes out of the planer mills.

VOC BACT Determination for Emergency Fire Pump Engine (FE)

Combustion of ultra-low sulfur diesel (ULSD) in the emergency fire pump engine will result in emissions of small amounts of VOC. The engine will be subject to the requirements of NESHAP Subpart ZZZZ and NSPS Subpart IIII.

Step 1 BACT selection: Control Technology Identification

A RBLC search was completed by Albany Lumber for small (<500 bhp) internal combustion engines (process type 17.21 – fuel oil). The search was further refined to exclude entries without sufficient information to determine a VOC limit. Additionally, the search was refined to exclude engine sizes outside of the range set by 40 CFR 60 Subpart IIII for engines with the same emission limitations (≥130 bkW and ≤560 bkW). The results of this search are included in Table C-11 in Appendix C of the PSD permit application. The emission limits in the database were converted into lb/hp-hr for comparison purposes. All units indicate no control or good design and/or combustions practices for VOC control in fire pump engines. Though not historically used for BACT, a list of possible control technologies for an engine is provided below.

- Diesel Oxidation Catalyst
- Good Combustion Practices and Maintenance

Step 2 BACT selection: Technical Feasibility Analysis

Exhaust treatment catalyst or good combustion practices and proper maintenance can reduce VOC or Non Methane Hydrocarbons (NMHC) from the emergency fire pump engine. The control efficiencies depend on engine size, design and age.

Step 3 BACT selection: Ranking of Control Technology by Control Efficiency

All add on control and good combustion practices control technologies are technically feasible. Engine control technologies are primarily directed at limiting NO_X and CO emissions, since they are the primary pollutants emitted. As a result, there is little information on the control efficiency of VOC for each technology. However, there is information on the control efficiency of petroleum hydrocarbon (HC)[1], which can be used as a surrogate VOC control.

The level of control for HCs is expected to be greater than the actual control of total VOCs. A summary of the VOC control efficiencies of the technically feasible control technologies, ranked in order of HC control effectiveness is presented below.

- Diesel Oxidation Catalyst = 40-75% of HC
- Good Combustion Practices and Maintenance = base case, no additional reduction

[1] U.S. EPA, "Technical Bulletin - Diesel Oxidation Catalyst General Information", https://www.epa.gov/sites/production/files/2016-03/documents/420f10029.pdf

BACT selection Step 4: Cost Effectiveness Evaluation of Technically Feasible Control Options

The engine is for emergency use only; the use of the engine and resulting potential emissions of 0.2 tpy of VOC (based on 500 hrs./yr operation). The actual use of the engine will be well below potential as the engine is only used in the event of a fire (and periodic testing for unit readiness is capped at 100 hours per year by the engine NSPS). The cost per ton of VOC emission reduction through the above add on control technologies for this engine are not economically feasible at such low emission rates.

BACT selection Step 5: BACT Selection:

There are no cost-effective add-on control technologies for removing VOC emissions from an emergency fire pump engine and therefore, the BACT proposed by Albany Lumber for the emergency fire pump engine is "no control" with the use of "good combustion practices including proper engine maintenance and operation" as BACT. There are applicable NSPS Subpart IIII limits on the engine for hydrocarbon (HC) or HC + NO_X limits. Therefore, Albany Lumber has proposed an emission limit of 0.00251 lb/hp-hr TOC. This BACT limit applies during all operating conditions as there are no significant changes to the VOC emissions generated by the engine during startup and shutdown compared to normal operation.

EPD concurs with this BACT selection analysis for the emergency fire pump engine.

Albany Lumber has presented BACT analysis for control of VOC emissions from diesel and gasoline storage tanks. VOC emission from the diesel storage tanks is less than 0.01 tons per year since diesel is not a volatile liquid. VOC emissions from the gasoline storage tank is less than 0.38 tons/year. The extremely small quantity of VOC emissions makes any add on control technology for controlling VOC emissions cost prohibitive.
The only feasible control methods for minimizing VOC emissions from the diesel and gasoline storage tanks is by painting the tank exterior with light colored paint (silver or white) and by bottom submerged tank filling. Therefore, the BACT analysis for the diesel and gasoline storage tanks presented in the PSD permit application is not discussed further in this preliminary determination.

5.0 MONITORING REQUIREMENTS

Testing Requirements:

There are no applicable testing requirements for the continuous drying kilns, emergency fire pump engine and the petroleum storage tanks.

Monitoring Requirements:

Albany Lumber will monitor the moisture content of lumber as it comes off the planar mill. The cyclofilter pressure drops in the Planer mill will also be monitored.

Compliance Assurance Monitoring (CAM) Applicability:

CAM is only applicable to emission units that have potential emissions greater than the major source threshold, located at a major source, use a control device to control a pollutant emitted in an amount greater than the major source threshold for that pollutant and have a specific emission standard for that pollutant.

Because the drying kilns do not have add-on control equipment for controlling VOC emissions the continuous lumber drying kilns are not subject to CAM.

The cyclofilters downstream of the planer mill are inherent process control equipment whose main purpose is product collection/recovery. CAM is not applicable to the planer mill cyclofilter and CAM is not triggered by the proposed lumber mill. Therefore, no CAM provisions are incorporated into the facility's permit.

6.0 AMBIENT AIR QUALITY REVIEW

An air quality analysis is required to determine the ambient impacts associated with the construction and operation of the proposed Albany lumber mill. The main purpose of the air quality analysis is to demonstrate that emissions from the proposed lumber mill, in conjunction with secondary emissions from growth associated with the new lumber mill, will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class I or Class II area. NAAQS exist for NO_2, CO, $PM_{2.5,}$, PM_{10}, SO_2, Ozone (O_3), and lead. PSD increments exist for SO_2, NO_2, and PM_{10}. There is no NAAQS and PSD increment for VOC.

The proposed Albany Lumber mill triggers a PSD review for VOC only. An air quality analysis was conducted to demonstrate the facility's compliance with the Georgia Air Toxics program. This section of the preliminary determination discusses the air quality analysis requirements, methodologies, and results. Supporting documentation can be found in the Air Quality Dispersion Report of the PSD permit application and in the enclosed EPD's dispersion modeling memo.

Class I Area Analysis

Federal Class I areas are regions of special national or regional value from a natural, scenic, recreational or historic perspective. Class I areas are afforded the highest degree of protection among the types of areas classified under the PSD regulations. U.S. EPA has established policies and procedures that generally restrict consideration of impacts of a PSD source on Class I Increments to facilities that are located near a federal Class I area. PSD permitting regulations afford Class I areas additional protection against adverse impacts on PSD increments and air quality related values (e.g., visibility and deposition). U.S. EPA and Federal Land Manager guidance generally requires that sources located within 300 km of one or more Class I areas evaluate whether PSD Class I increments and certain air quality related values be adversely affected. Historically, a distance of 100 km has been used to define "near", but more recently, a distance of 200 kilometers has been used for all facilities that do not combust coal.

The two Class I areas within approximately 200 kilometers of the proposed Albany Lumber are the Saint Marks Wilderness and Okefenokee Wilderness, located approximately 155 and 165 kilometers South and Southeast of the facility. The U.S. Fish and Wildlife Service (FWS) is the designated Federal Land Manager (FLM) responsible for oversight of these Class I areas.

The proposed project would cause a significant net emissions increase only of VOC, which is not a visibility or deposition-affecting pollutant and for which there is no Class I PSD Increment. For this reason and because the project would not cause significant increases of NO_X, SO_2 or PM that may affect visibility or deposition and for which PSD Class I Increments have been established, Class I area impact analyses is not required for the proposed Albany Lumber mill.

Class II Area Analysis

Because the proposed project triggers PSD review for VOC, an ambient impact analysis for ozone is required as VOC is considered a precursor pollutant to ozone formation. The ozone ambient impact analysis also considers the project increases in NO_X emissions, as NO_X is also a Ozone precursor pollutant, even though NO_X is not subject to PSD review. The combined impact of NO_X and VOC precursor emissions form the Albany Lumber are evaluated in conjunction with current ambient background levels of ozone and U.S. EPA's Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate compliance with the ozone NAAQS.

Since VOC emissions exceed the monitoring *de minimis* level of 100 tpy, an evaluation is required to determine if representative ozone data are available in lieu of pre-construction ozone monitoring.

Ozone Impact Analysis

The closest ozone monitor relative to the proposed Albany Lumber is the Leslie-Union High School monitor which is approximately 27 miles to the north-northwest, located at N Bass St/E Allen St., in Leslie, Georgia (AQS ID 13-261-1001).

Given its proximity to the proposed Albany Lumber facility, and the regional nature of background ozone, the Leslie-Union High School monitor provides a representative indication of ozone concentrations in the vicinity of the proposed Albany Lumber mill. The monitor is operated by Georgia EPD and its *2016 Ambient Monitoring Plan*[2] describes the siting, exposure, measurement techniques and frequency, and related technical details for the monitor. The availability of representative monitored ozone data that were collected appropriately precludes the need for additional pre-construction ambient ozone monitoring for the project. Data in Table 7-1 of the PSD permit application indicates that the monitor has measured ambient ozone concentrations in attainment with the ozone NAAQS and also indicates a downward trend and improved ozone air quality over the last 10 or more years.

In the southeastern United States, ozone formation is limited by NO_X emissions due to high amounts of biogenic VOC in the atmosphere. The proposed Albany Lumber mill will be located in Dougherty County.

As noted, the proposed project will not trigger PSD review for NO_X but the project will trigger PSD for VOC emissions. VOC emissions by source sector in Dougherty County were compiled from the U.S. EPA Air Emission Sources database.[3]

Figure 7-2 of the PSD permit application is a summary of Ozone precursor emissions (VOC) in Dougherty County, Georgia indicates that that the proposed Albany Lumber will increase VOC emissions (770.9 tons) in Dougherty County by approximately 5% compared to the existing inventory (14,655 tons), a relatively low amount.

[2] Georgia EPD, *2016 Ambient Monitoring Plan*. https://airgeorgia.org/docs/report16.pdf

[3] https://gispub.epa.gov/neireport/2014/

In addition, VOC and NO_X emissions are below the critical air quality threshold per the draft U.S. EPA and Georgia EPD MERP guidance, because ozone formation is NO_X limited in the southeast, the increase in VOC emissions from the proposed project is not expected to significantly affect ozone concentrations in the vicinity of or downwind of the proposed Albany Lumber mill.

Therefore the Albany Lumber will not impact the ozone attainment in the area surrounding the mill based on data from monitored levels of Ozone in Dougherty County and the emission increases from the lumber mill.

Significance Analysis: Ambient Monitoring Requirements and Source Inventories

Significance Analysis is not required for the Albany Lumber since Significant Impact Levels (SIL) do not exist for VOC.

NAAQS Analysis

A NAAQS analysis is not needed for VOC since primary/secondary NAAQS do not exist for VOC.

PSD Increment Analysis

PSD increment analysis is not needed for VOC since PSD increments do not exist for VOC.

7.0 ADDITIONAL IMPACT ANALYSES

PSD requires an analysis of impairment to visibility, soils and vegetation that will occur as a result of the proposed lumber mill and an analysis of the air quality impact projected for the area as a result of the general commercial, residential and other growth associated with the proposed project.

Soils and Vegetation

The PSD regulations require an evaluation of the impact of project emissions on soils and vegetation. The analysis is required only for those pollutants for which PSD review is triggered. According to *A Screening Procedure for the Impacts of Air Pollution on Plants, Soils and Animals*[4], the relevant pollutants for soils and vegetation are NO_2, SO_2 and CO. The proposed Albany Lumber triggered PSD review for VOC only and does not have a significant net emissions increase of NO_2, SO_2 or CO. Therefore, a soils and vegetation analysis is not required since no significant impacts are expected.

Growth

The growth analysis evaluates the impact associated with the project on the general commercial, residential and industrial growth within the project vicinity. PSD requires an assessment of the secondary impacts from applicable projects. The work force expected for the Project will be approximately 300 during various phases of construction. It is expected that a significant regional construction force is already available to build the proposed Albany Lumber mill.

Therefore, it is expected that no new housing, commercial or industrial construction will be necessary during the construction schedule. Albany Lumber will also require 132 permanent positions. Individuals that already live in the region will perform a number of these jobs. For any new personnel moving to the area, no new housing requirements are expected. Further, due to the small number of new individuals expected to move onto the area to support the Albany Lumber facility and existence of some commercial activity in the area, new commercial construction will not be necessary to support the proposed mill's permanent work force. In addition, no significant level of industrial related support will be necessary, thus industrial growth is not expected. Based on the growth expectations above no new significant emissions from secondary growth during construction and operation of the proposed Albany Lumber are anticipated. Therefore, no analysis of secondary impacts from associated growth is warranted for this project.

Visibility

The PSD regulations require an evaluation of the impact of project emissions on visibility in Class II areas. The analysis is required only for those pollutants for which PSD review is triggered. The relevant pollutants for visibility are PM, NO_X and SO_2. The project triggers PSD review for VOC only and does not have a significant net emissions increase of PM, NO_X and SO_2. Therefore, a visibility analysis is not necessary because no significant impacts are expected.

[4] U.S. EPA, "*A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals*," December 12, 1980.

8.0 GEORGIA TOXIC AIR POLLUTANT MODELLING ANALYSIS

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program covered by the provisions of *Georgia Rules for Air Quality Control*, 391-3-1-.02(2)(a)3.(ii).

A toxic air pollutant (TAP) is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Procedures governing the Georgia EPD's review of TAP emissions as part of air permit reviews are contained in the agency's "*Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised)*."

Modeling Analysis

The air quality modeling analysis was conducted in accordance with Appendix W of Title 40 of the Code of Federal Regulations (CFR) §51, *Guideline on Air Quality Models*, and Georgia EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised).*

The proposed project will cause net emission increases of VOC that is greater than the applicable PSD Significant Emission Rates (SERs). VOC does not have established PSD modeling significance levels (MSL) (an ambient concentration expressed in either $\mu g/m^3$ or ppm).

Modeling Methodology

Details on the dispersion model, including meteorological data, source data and receptors can be found in EPD's PSD Dispersion Modeling and Air Toxics Assessment Review in Appendix C of this Preliminary Determination and in the PSD permit application.

Selection of Toxic Air Pollutants for Modeling

For projects with quantifiable increases in TAP emissions, an air dispersion modeling analysis is generally performed to demonstrate that off-property impacts are less than the established Acceptable Ambient Concentration (AAC) values.

The basic steps in the air toxics impact assessment are as follows:

1. Quantify emissions of TAPs from each emission unit;
2. Determine the acceptable ambient concentrations (AAC) for each TAP;
3. Conduct a dispersion modeling analysis to compute an ambient air concentration; and
4. Compare the modeled concentration to the AAC.

Acetaldehyde, formaldehyde and methanol were considered in the TAP analysis since these are emitted in significant amounts . Detailed emissions calculations for these TAPs are provided in Appendix B of the PSD permit application.

The AACs for acetaldehyde, formaldehyde and methanol were obtained from the Georgia EPD database with the exception of methanol which was supplemented with information from U.S. EPA.

Methanol modeling results were evaluated relative to the annual AAC from EPA's IRIS database as well as the 24-hour AAC provided by Georgia EPD. Note for formaldehyde, Georgia EPD specifies a range of AACs where the maximum of the range is 1.1 µg/m^3. This value was used as the 24 hour AAC for Formaldehyde.

For each TAP identified for further analysis, both the short-term and long-term (annual) AACs were calculated following the procedures given in Georgia EPD's *Guideline*. Albany Lumber referenced the resources previously detailed to determine the long-term (i.e., annual average) and short-term AAC (i.e., 24-hour or 15-minute). The AACs were verified by the EPD in its modeling review.

Determination of Toxic Air Pollutant Impact

The latest version of U.S. EPA's AERMOD model (version 18081) was used to perform dispersion modeling since AERMOD represents the best available model for this type of dispersion analysis. Evaluation of building downwash is considered appropriate to accurately represent modeled concentrations, building downwash was included in the air toxics modeling analysis.

A Good Engineering Practice (GEP) stack height analysis was performed for all point/stack sources included in the modeling in accordance with U.S. EPA's guidelines.

Five years of surface meteorological data from Southwest Georgia Regional Airport in Albany, Georgia (2013-2017) with concurrent upper air data from Tallahassee Regional Airport in Florida was used in the dispersion modeling runs. The pre-processed meteorological data was obtained from Georgia EPD[5].

A Cartesian receptor grid extending approximately 20 km from the facility centroid was used in the modeling.

Each continuous drying kiln (CDK) will emit from two stacks (one at each end of the kiln) and from the ends of each kiln that will remain open during continuous operations. Albany Lumber utilized the kiln designer's estimate and observation of comparable operations at other facilities that 80% of the total airflow and emissions is directed up the stacks and 20% of the total airflow and emissions is released through the kiln ends. The kiln stacks were modeled using point source stack parameters and emissions from the open kiln ends were modeled as volume sources to represent the non-vertical discharge.

Source parameters for the point sources and volume sources, respectively, used in the modeling analysis are in Table 6-1 and 6-2 of the PSD permit application.

Short-term modeling was conducted with maximum hourly emission rates while annual modeling was conducted with annualized emissions based on the proposed annual throughputs for the kilns.

[5] https://epd.georgia.gov/air/georgia-aermet-meteorological-data

Emission rates for modeling of acetaldehyde, formaldehyde and methanol are provided in Table 6-3 and Table 6-4 of the PSD permit application. These were verified by EPD.

Table 1 compares the maximum modeled concentration per pollutant and averaging period to the applicable AAC. As specified in the *Guideline*, 15-minute average concentrations were determined using a 1.32 scaling factor for 1-hour average model results. In addition, per the *Guideline*, a 24-hour AAC only needs to be evaluated if there is no annual (RBAC or RfC) threshold.

Table 1. Summary of Maximum AERMOD Dispersion Modeling Results vs. AACs

Pollutant	CAS	Averaging Period	AAC ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	Averaging Period	AAC ($\mu g/m^3$)	MGLC ($\mu g/m^3$)
Acetaldehyde	75070	Annual	4.55	2.21	15-min	4,500	111.65
Formaldehyde	50000	Annual	1.1	0.72	15-min	245	34.47
Methanol	67561	24-hr	619	159.17	15-min	32800	646.73

Note: All concentrations are the highest 1st high modeled impacts for all 5 model years.

Table 1 summarizes the AAC levels and MGLCs of the TAPs. The maximum 15-min impact is based on the maximum 1-hour modeled impact multiplied by a factor of 1.32. The modeled MGLCs for all three TAPs are below their respective AAC levels. Therefore, the applicant meets the applicable Georgia Air Toxics Guideline.

As seen in Table 1, the dispersion modeling demonstrates that facility-wide emissions of each evaluated TAP do not result in an exceedance of an AAC.

Conclusion

The air quality analysis reviewed and described above demonstrates the conformance of the project's air pollutant impacts with Class I and Class II PSD NAAQS regulations and GA EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions*. The additional air quality impact on soil, vegetation, and visibility is expected to be very minimal.

For these reasons, it is recommended a permit to be issued based on the project design and operating hours described in the application.

9.0 EXPLANATION OF DRAFT PERMIT CONDITIONS

The permit requirements for this proposed facility are included in draft PSD Permit No. 2421-095-0117-P-01-0.

Section 2.0: Allowable Emissions:

Condition 2.1 limits drying in the three continuous drying kilns to a combined total of 360 million board feet of dried lumber in a year. This condition states that a VOC emission factor of 4.28 lb/mbf (as carbon) can be used to estimate VOC emissions from the drying kilns. This is the VOC BACT limit proposed by Albany Lumber for the drying kiln.

Condition 2.2 is the BACT limit for Total Organic Compound (TOC) emissions from the diesel-fired emergency fire pump engine. This is also the engine NSPS Subpart IIII and the RICE MACT 40 CFR 63 Subpart ZZZZ TOC emission limit for the fire pump engine. This limit applies during all operations of the engine.

Condition 2.3 is the BACT VOC emission limit proposed for the gasoline storage tank. This condition also requires submerged bottom tank filling for all gasoline loaded into the gasoline storage tank.

Condition 2.4 requires the construction and operation of the Albany Lumber to be consistent with the PSD permit application No. 26682. EPD may take proper enforcement action for violation of the proposal in the PSD permit application.

Condition 2.5 states that the construction and operating permit for the Albany Lumber will become void if construction is not commenced within 18 months after issuance of the permit or if construction is discontinued for a period of 18 months or more or if construction is not completed within a reasonable time. The Director may grant an extension to the 18 month period upon satisfactory demonstration by Albany Lumber that such an extension is justified.

Condition 2.6 states that all three continuous drying kilns are subject to all applicable requirements of the Plywood and Composite Wood Product MACT 40 CFR 63 Subpart DDDD.

Condition 2.7 subjects the proposed fire pump engine to all applicable requirements of the engine NSPS 40 CFR 60 Subpart IIII.

Condition 2.8 is the Non methane hydrocarbon + NOx and PM emission limit per the engine NSPS for the emergency fire pump engine.

Condition 2.9 requires the Permittee to use ultra-low sulfur diesel fuel with a sulfur content of 15 ppm or less in the fire pump engine per the engine NSPS.

Condition 2.10 restricts the maintenance checking and readiness testing of the fire pump engine to 100 hours per year.

This NSPS allows 50 hours per year of non-emergency operations which is included in the 100 hours per year of non-emergency operations for maintenance and readiness testing.

Condition 2.11 subjects the fire pump engine to all applicable provisions of the RICE MACT 40 CFR 63 Subpart ZZZZ.

Condition 2.12 requires the Permittee to operate the fire pump engine per manufacturer specification in order to minimize emissions per the RICE MACT.

Condition 2.13 limits visible emission opacity from the drying kiln, planer mill and the fire pump engine to 40% per Georgia Rule (b).

Condition 2.14 limits the PM emissions from the sawmill, drying kilns and the planer mill per Georgia Rule (e).

Condition 2.15 requires the Permittee to fire the drying kilns with natural gas only in order to avoid the kilns from being a PSD major source for $PM_{2.5}$ emissions.

Section 3 Fugitive Emissions:

Condition 3.1 lists some measures the Permittee should take in order to minimize fugitive emissions from the lumber mill operations per Georgia Rule (n).

Condition 3.2 limits fugitive emissions opacity to 20% or less per Georgia Rule (n)2.

Section 4 Process & Control Equipment Conditions

Condition 4.1 requires Albany Lumber to perform weekly inspection of the planer mill cyclofilter. Any adverse conditions resulting from cyclone inspection that is not corrected within 48 hours must be reported to EPD.

Condition 4.2 requires the Permittee to develop and implement a work practice and a preventive maintenance program (PMP) for the continuous drying kilns within 180 days of startup. This is BACT for the drying kilns.

Section 5.0: Requirements for Monitoring

Condition 5.2 requires the Permittee to continuously monitor the moisture content of the dried lumber at the planer mill outlet in order to minimize VOC emissions from the lumber.

Condition 5.3 requires the Permittee to install, calibrate and operate a non-resettable hour meter to record the non-emergency hours of operation of the fire pump engine for maintenance checks, readiness testing and other non-emergency operation per the engine NSPS.

Section 6.0: Requirements for Testing

This section (Condition 6.1) contains general testing requirements for the sources at the Albany Lumber mill.

Section 7.0: Other Recordkeeping and Reporting Requirements

Condition 7.1 requires Albany Lumber to submit a startup notification to EPD within 15 days after startup of the lumber mill.

Condition 7.2. requires the Permittee to report exceedance of the combined total drying limit of 360 MMBF/year in the drying kiln.

Condition 7.3 requires Albany Lumber to report any use of fuel oil with more than 15 ppm of sulfur in the emergency fire pump engine.

Condition 7.4 requires reporting of any adverse conditions discovered by the weekly inspection of the planer mill cyclofilter that is not corrected within 48 hours.

Condition 7.5 requires the Permittee to keep monthly records of the natural gas consumed in the drying kiln burners.

Condition 7.6 requires the Permittee to maintain monthly records of the amount of the dried lumber processed through the continuous drying Kilns CDK1, CDK2 and CDK3 to ensure compliance with the combined total drying limit in Condition 2.1.

Condition 7.7 requires the Permittee to use the monthly drying records from Condition 7.6, for the continuous kilns to calculate the combined total lumber dried during the last twelve months each month to demonstrate compliance with the drying limit for the kilns in Condition 2.1.
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Condition 7.8 requires the Permittee to submit a semi-annual report containing records of the combined total lumber dried in the drying kilns over the last twelve consecutive months each month using data from Condition 7.7.

Condition 7.9 requires the Permittee to notify EPD whenever the combined total lumber dried in the drying kilns exceed 30 MMBF during any month.

Condition 7.10 requires the Permittee to demonstrate compliance with the emission limits in the engine NSPS for the emergency fire pump engine by purchasing a certified engine that is compliant with emission standards in 60.4205(c), for the same model year and maximum engine power.

Condition 7.11 requires the Permittee to maintain a copy of the manufacturer's written operating and maintenance instructions or operating and maintenance procedures developed by the Permittee that are approved by the engine manufacturer to comply with requirements of the engine NSPS.

Condition 7.12 requires the Permittee to maintain records of the maintenance and testing hours for the fire pump engine each month and over the last twelve month to ensure compliance with the non-emergency operation hour limit per the engine NSPS in Condition 5.3.

Condition 7.13 requires the Permittee to maintain the vendor supply data for the sulfur content of the diesel fuel fired in the emergency fire pump engine.

Condition 7.14 requires Albany Lumber to notify EPD of the commencement of construction of the sawmill, drying kilns, the planar mill, the emergency fire pump engine and the diesel and gasoline storage tanks within 15 days.

Section 8.0: Other Specific Requirements

Condition 8.2 requires the Permittee to calculate and pay an annual Permit fee to the Division as per "Procedures for Calculating Air Permit Fees.". The Permit fee shall also include the emission fees that are calculated based on actual emissions from the facility.

Condition 8.3 requires the Permittee to submit a completed Part 70 Operating Permit application to the Division electronically using GEOS permit application software within 12 months after startup of operations of equipment in the PSD permit.

APPENDIX A

EPD'S PSD Dispersion Modeling and Air Toxics Assessment Review

MEMORANDUM

September 21, 2018

To: Manny Patel, Seetharaman Ganapathy
Thru: Di Tian
From: Yan Huang
Subject: PSD Modeling Review for Albany Lumber Mill Project, Albany, Dougherty County, GA

GENERAL INFORMATION

Albany Lumber Sawmill (GP-Albany) submitted a permit application for the construction and operations of a new lumbermill that produces kiln dried dimensional lumber in Albany, Dougherty County, Georgia. The Albany lumbermill will be a new major stationary source with respect to PSD permitting. The projected emission from the GP-Albany facility triggers PSD for VOC only. Air dispersion modeling for this new facility was conducted by GP-Albany's consultant, AECOM, to assess conformance of proposed emission limits for the subject emission sources on site with the Georgia Air Toxics Guideline and the applicable federal Prevention of Significant Deterioration (PSD) air quality standards.

This memo discusses the procedures used to review the supporting dispersion modeling. VOC is the only pollutant with projected emissions in excess of the Significant Emission Rate (SER). Ozone ambient impact analysis over the project area and secondary ozone formation analysis show no adverse impacts from the proposed lumbermill VOC and NOx emissions. The air toxic impacts of the three most significant Toxic Air Pollutants (TAPs) from the proposed lumbermill do not exceed their applicable Acceptable Ambient Concentrations (AACs). The results of these modeling evaluations are summarized in the following sections of this memorandum.

INPUT DATA

1. **Meteorological Data** – The hourly meteorological data (2013-2017) used in this review were generated and provided by the GA EPD (http://epd.georgia.gov/air/georgia-aermet-meteorological-data). The data were processed from the meteorological measurement data obtained from Albany Southwest Georgia Regional Airport NWS surface station, GA, and Tallahassee Regional Airport NWS upper air station, FL, using the AERSURFACE (v.13016), AERMINUTE (v.15272), and AERMET (v. 18081) with the adjusted surface friction velocity option (ADJ_U*). The Albany Airport is approximately 12 kilometers to the southwest of the GP-Albany facility and therefore this dataset is representative for the project site.

2. **Source Data** – Emission unit physical parameters, criteria and TAP emission rates were provided by the applicant and have been subjected to GA EPD engineering review.

Tables 6-1 and 6-2 from the application summarized modeled point and volume source parameters and the facility-wide TAP emission from the proposed project. The emissions from the proposed three new continuous dry kilns (CDK1, CDK2, and CDK3) are partitioned on an 80/20 basis with 80% of the emissions being discharged from the powered stack and 20% out the kiln doors at each end of the kiln. The kiln stacks were modeled as point sources and emissions from the open kiln ends were modeled as volume sources to represent the non-vertical discharge. The initial lateral and vertical dimension of such volume sources were revised as 1.701m and 4.395m respectively, considering the initial plume spread/rise (usually 2 ft for spread and 5 ft for rise) according to the GA EPD Toxic Impact Assessment Guideline at https://epd.georgia.gov/air/documents/toxics-impact-assessment-guideline.

The toxic impacts from two emission scenarios were evaluated. Table 6-3 and 6-4 summarized the emission rates of both short-term and annual modeling. Short term modeling was conducted with maximum hourly emission rates while annual modeling was conducted with annualized emissions based on annual throughputs for the kilns.

3. **Receptor Locations** – Discrete receptors with 50-meter intervals were placed on a Cartesian grid along the fence-line. Receptors extend outwards from the fence line at 100-meter intervals to approximately 2 kilometer, at 250-meter intervals to approximately 5 kilometer, at 500-meter intervals to approximately 10 kilometer, and at 1000-meter intervals to approximately 20km. This domain is sufficient to capture the maximum impact. All receptor locations are represented in the Universal Transverse Mercator (UTM) projections, Zone 16, North American Datum 1983.

4. **Terrain Elevation** – Topography was found to be generally flat in the site vicinity. Terrain data from USGS 1-sec National Elevation Dataset (NED) CONUS were extracted to obtain the elevations of all sources and receptors by AERMAP terrain processor (version 18081). The resulting elevation data were verified by comparing contoured receptor elevations with Google satellite map.

5. **Building Downwash** – The potential effect for building downwash was evaluated via the "Good Engineering Practice (GEP)" stack height analysis, and was based on the scaled site plan included in the application using the BPIPPRM program (version 04274). The BPIPPRM model was used to derive building dimensions for downwash assessment and the assessment of cavity-region concentrations appropriate for the AERMOD model.

CLASS I AREA IMPACT ANALYSIS

Three Class I areas exist within a 300 km range from the proposed GP-Albany Lumbermill, these are: Wolf Island, Okefenokee, and Saint Marks National Wilderness Areas. Among these, Saint Marks Wilderness Area is the closest, located approximately 155 km south from the facility. There are no PSD increments or air quality related values for VOC. Therefore, a Class I area PSD review is not required.

CLASS II AREA IMPACT ANALYSIS

VOC is the only criteria pollutant with emissions greater than the SER (40 tpy), therefore neither Class II area significant impact analysis, nor monitoring *De Minimis* concentration analysis are required. In addition, the potential soil and vegetation impacts and the Class II visibility analysis are not required.

Ozone Impact Analysis

PSD permit applicants with a proposed net emission increase of 100 tons/year or more of VOC and/or NOx are required to conduct an ambient air impact analysis that includes pre-application monitoring data to determine the current state of the ambient air conditions for this pollutant.

The proposed GP-Albany expansion project is expected to emit 770.9 tpy VOC. The nearest ozone monitor to GP-Albany is located approximately 43.5 km north at Leslie-Union High school, Leslie, Sumter County, Georgia (AQS ID 13-261-1001). Given this proximity and regional nature of background ozone, the GA EPD Leslie monitor provides a representative indication of ozone concentrations in the vicinity of GP-Albany facility. The applicant examined the 3-year rolling average ozone concentration at this monitor. The latest design value (i.e. 3-year average of 4th highest maximum daily 8-hour ozone concentrations during 2015-2017) is 60 ppb. This area is in attainment with the 2015 ozone National Ambient Air Quality Standard (NAAQS) of 70 ppb.

As required by the 2017 revisions to *EPA's Guideline on Air Quality Models (Appendix W)*, the applicant evaluated the impact of the projected VOC and NOx emissions on secondary ozone formation following the EPA's "*Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier l Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program*" (December 2, 2016), and GA EPD's "*Guidance on the Use of EPA's MERPs to Account for Secondary Formation of Ozone and $PM_{2.5}$ in Georgia*" (September 19, 2018). According to the GA EPD's guidance document, the most conservative (lowest) VOC and NOx MERP values for ozone in Georgia are 3980 tpy and 156 tpy respectively. The projected VOC emission increase of 770.9 tpy equates to an ozone impact of 0.194 ppb (=770.9/3980 *1 ppb), and the projected NOx emission increase of 32.2 tpy equates to an ozone impact of 0.206 ppb (= 32.2/156 *1 ppb). The total impact of 0.400 ppb (= 0.194+0.206) is below the ozone significant impact level (SIL) (1 ppb).

AIR TOXICS ASSESSMENT

The primary TAP emissions from lumber mills are Acetaldehyde, Formaldehyde, and Methanol. The annual, 24-hour, and 15-minute AACs of the TAPs were reviewed based on U.S. EPA IRIS reference concentration (RfC), OSHA Permissible Exposure (PEL), ACGIH Threshold Limit Values (TLV) including STEL (short term exposure limit) or ceiling limit, and NIOSH Recommended Standards (REL) according to the Georgia Air Toxics Guideline. The modeled MGLCs were calculated using the AERMOD dispersion model (version 18081) for 1-hour, 24-hour, and annual averaging periods with the revised initial lateral and vertical dimensions of volume sources.

Table 1. Modeled MGLCs and the Respective AACs at Annual, 24-hr, and 15-min Averaging Periods

Pollutant	CAS	Averaging Period	AAC ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	Averaging Period	AAC ($\mu g/m^3$)	MGLC ($\mu g/m^3$)
Acetaldehyde	75070	Annual	4.55	2.21	15-min	4,500	111.65
Formaldehyde	50000	Annual	1.1	0.72	15-min	245	34.47
Methanol	67561	24-hr	619	159.17	15-min	32800	646.73

Note: All concentrations are the highest 1st high modeled impacts for all 5 model years.

Table 1 summarizes the AAC levels and MGLCs of the TAPs. The maximum 15-min impact is based on the maximum 1-hour modeled impact multiplied by a factor of 1.32. The modeled MGLCs for all three TAPs are below their respective AAC levels. Therefore, the applicant meets the applicable Georgia Air Toxics Guideline.

CONCLUSIONS

The air quality analysis reviewed and described in the above sections demonstrates the conformance of the project's air pollutant impacts with Class I and Class II PSD NAAQS regulations and GA EPD's Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions. The additional air quality impact on soil, vegetation, and visibility is expected to be very minimal.

For these reasons, it is recommended a permit to be issued based on the project design and operating hours described in the application.